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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,810	09/25/2003	Michael J. Hennessy	HENN-2	7751

7590 08/23/2007

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EXAMINER	
KAPLAN, HAL IRA	

ART UNIT	PAPER NUMBER
2836	

MAIL DATE	DELIVERY MODE
08/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/670,810	HENNESSY ET AL.	
	Examiner	Art Unit	
	Hal I. Kaplan	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7,9 and 11-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,3,5-7,9,11,16,18,20 and 21* is/are allowed.

6)☒ Claim(s) *2,12,17,22 and 23* is/are rejected.

7)☒ Claim(s) *13-15 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *20070515*.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Examiner would like to thank the Applicant for the time and courtesies extended in the telephonic interview on May 15, 2007.

Claim Rejections - 35 USC § 103

2. The indicated allowability of claims 2, 12, and 17 is withdrawn in view of the newly discovered reference(s) to Lotfi et al. Rejections based on the newly cited reference(s) follow.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US patent of Rockot et al. (5,793,586) in view of the US patent of Lotfi et al. (6,903,373).

As to claim 2, Rockot discloses a hybrid switch in a line (3,4), comprising: a first switching module (S1) for switching voltages and currents and for incurring substantially all switching losses during the turn on transition from a current off state of the hybrid switch to a current on state and during the turn off transition from said on state to off state of the hybrid switch; and a second switching module (8,20) for conducting current between switching transitions and for incurring substantially all conduction losses; said first and second modules (S1,8,20) being connected electrically in parallel, and respectively controllable to be in one of an open non-conducting state and a closed conducting state, at least one said module (8) having solid state construction (see column 3, lines 19-50 and Figure 2). Rockot does not disclose the claimed MOSFET.

Lotfi discloses a MOSFET (107) for use as a switch (see column 1, lines 1-31 and column 2, lines 7-17). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to have used a MOSFET as the switch in the circuit of Rockot, in order to increase the switching speed, reduce switching losses, and reduce the size of the device.

As to claims 22 and 23, Rockot in view of Lotfi do not disclose at least two second or first switching modules, but it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have constructed the circuit with at least two second switching modules or at least two first switching modules, because it has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). See MPEP §2144.04(VI)(B).

7. Claims 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockot in view of Lotfi as applied to claim 2 above, and further in view of the US patent of Gold et al. (5,953,224).

As to claims 12 and 17, Rockot in view of Lotfi disclose all of the claimed features, as set forth above, except for the claimed cryogenic cooling and refrigeration unit. Gold discloses a refrigeration unit (18) used to cryogenically cool a switching circuit (see column 2, line 60 through column 3, line 4, and column 8, lines 28-42). It would have been obvious to one of ordinary skill in the art, at the time of the invention, to cryogenically cool the switches of Rockot, in order to enhance their electrical characteristics.

Allowable Subject Matter

8. Claims 1, 3, 5-7, 9, 11, 16, 18, 20, and 21 allowed.

9. Claims 13-15 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is an examiner's statement of reasons for allowance:

Claims 1, 3, 5-7, 9, 11, 16, 18, 20, and 21 are allowed, and claims 13-15 and 19 contain allowable subject matter, because, as discussed in the telephonic interview on May 15, 2007, and noted in the Office Action dated February 26, 2007, none of the prior art of record discloses or suggests respectively switching the first and second modules on and off, each module in a predetermined sequence and for predetermined intervals to reduce power losses in the conduction and switching operation of the hybrid switch, in combination with the remaining claimed features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

11. Applicant's arguments filed May 23, 2007 have been fully considered but they are not persuasive. As to Applicant's argument that Rockot is not intended for and does not describe repetitive switch opening and closing, and refers only to the major event of opening the switch, Rockot refers to closing the switch (turning the switch on) and opening the switch (turning the switch off) at column 4, lines 52 and 56). The switching sequence disclosed by Rockot can repeat.

12. In response to applicant's argument that Rockot is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was

concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Rockot discloses a hybrid switch with first and second switching modules connected in parallel, wherein the first and second switching modules are repeatedly switched on and off. Rockot is therefore analogous art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal I. Kaplan whose telephone number is 571-272-8587. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on 571-272-2084. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

8/19/09

MICHAEL SHERRY
SUPERVISORY PATENT EXAMINER